

Patent Claims

1. Method for operating MIMO air interfaces in mobile communication systems in which a radio signal (A, B, C) is transmitted over a MIMO channel comprising a number of m sub channels (5) from a transmitting device (1) and is received by a receiving device (3),
wherein
different polarizations are assigned to the signals that are to be transmitted and received on the sub channels (5) and the signals are conducted to a common antenna (8, 11).
2. Method according to Claim 1, wherein, as the antenna (8, 11), an antenna array with spatially closely adjoining partial antennas (8.1, 8.2; 11.1, 11.) is used.
3. Method according to one of the preceding claims, wherein the phase centers of the partial antennas coincide.
4. Method according to one of the preceding claims, wherein assignment of the polarizations of the signals sent out on the sub channels (5) are governed by a control facility (9).
5. Method according to one of the preceding claims, wherein the polarizations of the signals sent out on the sub channels (5) are altered in pre-determined intervals of time.
6.
Method according to one of the preceding claims, wherein the polarizations the signal sent out on the sub channels (5) are synchronically altered.

7. Method according to one of the preceding claims, wherein the polarizations of the signals sent out on the sub channels (5) are exchanged among each other in pre-determined intervals of time.
8. Method according to one of the preceding claims, wherein a polarization selected by chance from a volume of pre-determined polarizations is assigned to each signal sent out on the sub channels (5).
9. Method according to one of the preceding claims, wherein that of the radio signal sent out on the MIMO channel, A B: C, by a digital multithread is modulated. whereby for the duration of at least one bit of the multithread do the polarizations of the signals sent out on the sub channels (5) remain same.
10. Method according to one of the preceding claims, wherein the radio signal sent out on the MIMO channel (A, B, C) is modulated by a digital multithread, whereby the polarizations of the signals sent out on the sub channels (5) change at least once during the duration of at least one bit of the multithread.
11. Method according to one of the preceding claims, wherein the polarization of the signals sent out on the sub channels (5) is determined by the relationship of the amounts of its performances a and/or $(1-a)$ and / or its mutual phase situation and / or its time offset (t_1, t_2) .

12. Method according to one of the preceding claims, wherein the number of switchable polarizations is at least as large as the number m of sub channels (5).

13. Device for operating MIMO air interfaces in mobile communication systems with a transmitting device (1) for sending out a radio signal (A, B, C) over a MIMO channel comprised of several sub channels (5) and a receiving device (3) for reception of the radio signal

wherein

facilities (6, 7, 12) for the production of different polarizations of the signals that are to be transmitted and received on the sub channels (5),

and

an antenna (8, 11) to which are conducted all the differently polarized signals of the sub channels (5).

14. Device according to Claim 13, wherein the antennas (8, 11) form an antenna array with at least two spatially closely located partial antennas (8.1, 8.2; 11.1, 11.2), whereby a signal of a sub channel (5) is conducted to each partial antenna.

15. Device according to one of the claims 13 or 14, wherein the phase centers of the partial antennas coincide.

16. Device according to one of the claims 13 to 15, wherein the antenna (11) is a cross dipole.

17. Device according to one of the claims 13 to 16, wherein the facilities include means (7 12) to change the phase situation and / or the time delay (t) of the radio signals.

18. Device according to one of the claims 13 to 17, wherein the facilities include means (6) for dividing the radio signal into several partial signals of various performance *a* and *1-a*.

19. Device according to one of the claims 13 to 18, wherein a control facility (9) to control the installations (6, 7, 12) is provided.